

I claim:

1. A non-sharp vascular infusion cannula for obtaining a medicine and introducing it to an I.V. assembly to introduction into a patient's body:

- a proximal end,
- a distal end,
- a mechanical connection for attaching to a syringe or other fluid source located at said proximal end,
- a non-sharp tip located at said distal end,
- an elongate body located between said proximal and distal ends,
- a hollow fluid passageway located within the interior of said elongate body, said hollow fluid passageway being capable of permitting the flow of a fluid from said proximal end at least partially to said distal end,
- a radial bulge on said elongate body, and
- at least one exit orifice located in the vicinity of said distal end, said exit orifice serving to permit fluid to exit said hollow fluid passageway through the exit orifice, or to enter the hollow fluid passageway through the exit orifice.

2. A device as recited in claim 1 wherein said exit orifice is located on said elongate body in a position that causes fluid travelling through the exit orifice to travel at approximately a right angle to fluid travelling through said elongate body.

3. A device as recited in claim 1 wherein said mechanical connection is selected from the group consisting of threaded fittings, luer locks, a tapered receptacle and a friction fit.

wherein the tapered receptacle has tapered cylindrical walls

4. A device as recited in claim 1 wherein said non-sharp tip has a shape selected from the group consisting of square, blunt, tapered and rounded.

5. A device as recited in claim 1 wherein said non-sharp tip will not impale human skin under the force or ordinary pressure exerted by fingers or hands.
6. A device as recited in claim 1 wherein said exit orifice is located on the side of the non-sharp vascular infusion cannula so that fluid that exits the exit orifice will not be traveling parallel to the path of fluid that is travelling through the hollow fluid passageway in the cannula interior.
7. A device as recited in claim 1 further comprising a one-way valve within the non-sharp vascular infusion cannula so that fluid may only flow in one direction through the cannula.
8. A device as recited in claim 7 wherein said one-way valve permits fluid to flow only from said proximal end to said distal end.
9. A device as recited in claim 7 wherein fluid may only flow from the distal end to the proximal end of the non-sharp vascular infusion cannula, but not the reverse.
10. A device as recited in claim 1 wherein said radial bulge is located closer to said distal end than to said proximal end.
11. A device as recited in claim 1 wherein said radial bulge has a greater radial dimension than said elongate body otherwise has in the vicinity of said elongate body adjacent said radial bulge.
12. A device as recited in claim 1 wherein said radial bulge has the ability to anchor the non-sharp vascular infusion cannula at a membrane of an I.V. apparatus.
13. A device as recited in claim 1 wherein said radial bulge has the ability to anchor the non-sharp vascular infusion cannular at the membrane of a medicine vial.

14. A device as recited in claim 1 wherein said radial bulge has the ability to anchor the non-sharp vascular infusion cannula for repetitive injection or aspiration of medicine.

15. A device as recited in claim 1 wherein if the non-sharp vascular infusion cannula is usable to impale a membrane of a medicine vial or of an I.V. apparatus, and once the radial bulge has penetrated past the membrane, the radial bulge tends to hold the non-sharp vascular infusion cannula in place at the membrane

16. A device as recited in claim 1 wherein said radial bulge has a shape selected from the group consisting of spherical, oval, elliptical, heart shaped, conical, triangular in cross section, rebated at the proximal side in cross section, hooked at the proximal side in cross section, heart shaped in cross section, diamond-shaped in cross section, top-shaped, turnip-shaped, curved and sloped.

17. A device as recited in claim 1 wherein said radial bulge has a steeper curvature or slope on its proximal side than on its distal side to tend to keep the non-sharp vascular infusion cannula in place on a membrane that the non-sharp vascular infusion cannula has impaled past the radial bulge because the radial bulge will tend to make it difficult to withdraw the non-sharp vascular infusion cannula from the membrane.

18. A non-sharp vascular infusion cannula for obtaining a medicine and introducing it to an I.V. assembly to introduction into a patient's body:

- a proximal end,
- a distal end,
- a mechanical connection for attaching to a syringe or other fluid source located at said proximal end,
- a non-sharp tip located at said distal end,
- an elongate body located between said proximal and distal ends,
- a hollow fluid passageway located within the interior of said elongate body, said hollow fluid passageway being capable of permitting the flow of a fluid from said proximal end at least partially to said distal end,

a radial bulge on said elongate body, and
at least one exit orifice located in the vicinity of said distal end, said exit orifice serving to permit fluid to exit said hollow fluid passageway through the exit orifice, or to enter the hollow fluid passageway through the exit orifice.

wherein said exit orifice is located on said elongate body in a position that causes fluid travelling through the exit orifice to travel at approximately a right angle to fluid travelling through said elongate body;

wherein said mechanical connection is selected from the group consisting of threaded fittings, luer locks, a tapered receptacle and a friction fit;

wherein the tapered receptacle has tapered cylindrical walls;

wherein said non-sharp tip has a shape selected from the group consisting of square, blunt, tapered and rounded;

wherein said non-sharp tip will not impale human skin under the force or ordinary pressure exerted by fingers or hands;

wherein said exit orifice is located on the side of the non-sharp vascular infusion cannula so that fluid that exits the exit orifice will not be traveling parallel to the path of fluid that is travelling through the hollow fluid passageway in the cannula interior;

wherein said radial bulge has a greater radial dimension than said elongate body otherwise has in the vicinity of said elongate body adjacent said radial bulge;

wherein said radial bulge has the ability to anchor the non-sharp vascular infusion cannula at a fluid-sealing membrane;

wherein the non-sharp vascular infusion cannula is usable to impale a membrane of a medicine vial or of an I.V. apparatus, and once the radial bulge has penetrated past the membrane, the radial bulge tends to hold the non-sharp vascular infusion cannula in place at the membrane;

wherein said radial bulge has a shape selected from the group consisting of spherical, oval, elliptical, heart shaped, conical, triangular in cross section, rebated at the proximal side in cross section, hooked at the proximal side in cross section, heart shaped in cross section, diamond-shaped in cross section, top-shaped, turnip-shaped, curved and sloped; and

wherein said radial bulge has a steeper curvature or slope on its proximal side than on its distal side to tend to keep the non-sharp vascular infusion cannula in place on a membrane that the non-sharp vascular infusion cannula has impaled past the radial bulge because the radial bulge will tend to make it difficult to withdraw the non-sharp vascular infusion cannula from the membrane.

19. A non-sharp vascular infusion cannula for obtaining a medicine and introducing it to an I.V. assembly to introduction into a patient's body:

- a proximal end,
- an elongate body,
- a fluid passageway at least partially within said elongate body,
- a non-sharp tip located at one end of said elongate body,
- an exit orifice on said elongate body in the vicinity of said non-sharp tip,

said exit orifice serving to permit fluid to exit said fluid passageway to the exterior of said elongate body, and

- a radial bulge on said elongate body.

20. A method for aspirating medicine from a medicine vial comprising the steps of:

- obtaining a syringe,
- obtaining a non-sharp vascular infusion cannula that includes
 - a proximal end,
 - an elongate body,
 - a fluid passageway at least partially within said elongate body,
 - a non-sharp tip located at one end of said elongate body,
 - an exit orifice on said elongate body in the vicinity of said non-sharp tip,

said exit orifice serving to permit fluid to exit said fluid passageway to the exterior of said elongate body, and

- a radial bulge on said elongate body,

installing said cannula on said syringe,

selecting a medicine vial from which medicine is to be aspirated,

impaling a fluid-sealing membrane on said medicine vial with said non-sharp tip so that said exit orifice is projected into medicine located within said medicine vial, but so that said radial bulge does not pass said fluid-sealing membrane,
aspirating medicine into said syringe from said medicine vial through said cannula, and
removing said syringe and cannula from said medicine vial.

21. A method for aspirating medicine from a medicine vial comprising the steps of:
- obtaining a syringe,
 - obtaining a non-sharp vascular infusion cannula that includes
 - a proximal end,
 - an elongate body,
 - a fluid passageway at least partially within said elongate body,
 - a non-sharp tip located at one end of said elongate body,
 - an exit orifice on said elongate body in the vicinity of said non-sharp tip, said exit orifice serving to permit fluid to exit said fluid passageway to the exterior of said elongate body, and
 - a radial bulge on said elongate body,
 - installing said cannula on said syringe,
 - selecting a medicine vial from which medicine is to be aspirated,
 - impaling a fluid-sealing membrane on said medicine vial with said non-sharp tip so that said exit orifice is projected into medicine located within said medicine vial, and so that said radial bulge passes and projected beyond said fluid-sealing membrane,
 - aspirating medicine into said syringe from said medicine vial through said cannula,
 - removing said syringe from said cannula, and
 - leaving said cannula in place on said medicine vial for later aspiration of additional medicine from said medicine vial.

22. A method for injecting medicine from a syringe into an IV apparatus comprising the steps of:

- obtaining a non-sharp vascular infusion cannula that includes
 - a proximal end,
 - an elongate body,
 - a fluid passageway at least partially within said elongate body,
 - a non-sharp tip located at one end of said elongate body,
 - an exit orifice on said elongate body in the vicinity of said non-sharp tip, said exit orifice serving to permit fluid to exit said fluid passageway to the exterior of said elongate body, and
 - a radial bulge on said elongate body,
- impaling a fluid-sealing membrane on an I.V. apparatus with said non-sharp tip so that said radial bulge passes and projected beyond said fluid-sealing membrane,
- obtaining a syringe containing a medicine to be injected into the I.V. apparatus,
- installing said syringe on said cannula,
- injecting medicine from said syringe into the I.V. apparatus through said cannula,
- removing said syringe from said cannula, and
- leaving said cannula in place on said I.V. apparatus for later injection of additional medicine from into the I.V. apparatus through the cannula.

23. A method for injecting medicine from a syringe into an IV apparatus comprising the steps of:

- selecting a medicine to injection into an I.V. apparatus,
- selecting a syringe to use for said injection,
- obtaining a non-sharp vascular infusion cannula that includes
 - a proximal end,
 - an elongate body,
 - a fluid passageway at least partially within said elongate body,
 - a non-sharp tip located at one end of said elongate body,

an exit orifice on said elongate body in the vicinity of said non-sharp tip, said exit orifice serving to permit fluid to exit said fluid passageway to the exterior of said elongate body, and

a radial bulge on said elongate body,

installing said non-sharp fluid cannula on said syringe,

impaling a fluid-sealing membrane on a medicine vial containing said medicine with said non-sharp tip so that said exit orifice projects into medicine within said vial, and such that said radial bulge does not pass or project beyond said fluid-sealing membrane,

aspirating medicine from said medicine vial into said syringe through said cannula,

removing said cannula from said medicine vial,

impaling a fluid-sealing membrane on an I.V. apparatus with said non-sharp tip so that said exit orifice is projected past said membrane,

into medicine located within said medicine vial, and so that said radial bulge passes and projects beyond said fluid-sealing membrane,

injecting medicine from said syringe into said I.V. apparatus through said cannula, and removing said syringe and said cannula from said I.V. apparatus.